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DATA FROM THE COMMERCIAL FISHERY FOR LAKE WHITEFISH, *Coregonus clupeaformis* (Mitchill), ON GREAT SLAVE LAKE, NORTHWEST TERRITORIES, 1980

by

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ABSTRACT

Moshenko, R.W., G. Low, and C.J. Read. 1981. Data from the commercial fishery for lake whitefish, *Coregonus clupeaformis* (Mitchill), on Great Slave Lake, Northwest Territories, 1980. Can. Data Rep. Fish. Aquat. Sci. 305: v + 30 p.

Data from the fish plant sampling on the Great Slave Lake commercial fishery, summer and partial winter, are presented. Production and catch per unit of effort by vessel type at weekly intervals by fishing area are shown. A total of 4822 lake whitefish were sampled for age, length and weight.

Key words: catch composition; catch/effort; catch statistics; commercial fishing; exploitation; fishery management; life history; mesh regulations; monitoring.

RESUME

Moshenko, R.W., G. Low, and C.J. Read. 1981. Data from the commercial fishery for lake whitefish, *Coregonus clupeaformis* (Mitchill), on Great Slave Lake, Northwest Territories, 1980. Can. Data Rep. Fish. Aquat. Sci. 305: v + 30 p.

L'étude présente les données découlant d'un échantillonnage à une usine de traitement du poisson dans le Great Slave Lake, à l'été et à l'hiver partial. Elles montrent la production et la prise par unité d'effort, à des intervalles hebdomadaires, par type de bateau et par zone de pêche. On a prélevé 4822 grands corégones pour en déterminer l'âge, la longueur et le poids.

Mots-clés: composition de la prise; prise/effort; statistiques des prises; pêche commerciale; exploitation; gestion de la pêche; cycle évolutif; réglementation du maillage; surveillance.

INTRODUCTION

In 1971, the Department of Fisheries began a long term stock assessment and monitoring program designed to collect information considered essential for the sound management of the Great Slave Lake commercial fishery, consistent with the recommendations of the Great Slave Working Party (1969). The objectives of this program are:

i) to maintain a record of the total commercial landings (production) by species, by weight and by administrative areas;

ii) to monitor the catch per unit of effort (CPE), cullage and change in relative abundance of all fish species landed through sampling of commercial net hauls;

iii) to assess the change in age, size, growth rate and mortality - especially in lake whitefish, and

iv) to assess the population structure of the various fish species.

In order to meet these objectives, a three-component field study was implemented. This consisted of:

i) Fish plant sampling - monitoring the landings of all commercial species and sampling the catch for biological information (age, length, weight), with special emphasis on lake whitefish;

ii) Fishery observations - monitoring the catch per unit of effort, cullage and relative abundance of all species landed, and

iii) Experimental netting - setting standard gangs of gillnets in the traditional commercial fishing areas of the lake.

Results of this work for the years 1972 to 1979 have been described by Bond (1974a, b, 1975a, b), Bond and Turnbull (1973), Moshenko and Low (1978a, b, 1979, 1980), and Moshenko et al. (1978).

Bond and Turnbull (1973) stated that lake whitefish population(s) in the western basin of Great Slave Lake were not overexploited. Healey (1975) discussed the effects of different levels of exploitation on lake whitefish populations in four lakes (Chitty, Drygeese, Baptiste and Alexie) north of Yellowknife during the period 1972-75. He found that as mortality is increased through increased exploitation, whitefish compensate by increasing their growth rates and correspondingly mature younger. Thus, a whitefish population with low mortality and slow growth rate possibly has a strong potential for exploitation. The optimum response of increased growth rates to heavy exploitation appears to occur when the bulk of the stable yield comes from fish five to eight years old. The level of exploitation of the population can be established by examining the growth rate, age of maturity, and age structure of the population. In 1978, after eight years of the exploitation experiment in these four lakes, Healey (1980) stated that significant increases in average size-at-age were recorded in the exploited lakes, and the degree and persistence of the increase were proportional to the intensity of exploitation.

In Great Slave Lake, whitefish growth rate is still relatively slow and the mortality is moderate. The bulk of whitefish biomass is in fish under age group 9 (Healey 1975). Over the past thirty years, the 5 1/2 in (140 mm) mesh commercial fishery has not significantly affected the age group where the biomass is greatest. The harvest is, therefore, coming from older and somewhat unproductive age groups 7-12, and the sustainable yield is lower than the population could support if younger fish were being harvested. Whitefish production dropped from 3.2 million pounds (1455 metric tonnes) in 1970 to about 2.0 - 2.3 million (909-1045 metric tonnes) between 1973-76 and increased slightly to a 2.5 million pounds (1136 metric tonnes) average for 1977 to 1980.

To apply Healey's research findings, an experimental management scheme was implemented at the start of the open-water season in 1977. The minimum mesh size was lowered from 5 1/2 in (140 mm) to 5 1/4 in (133 mm). This measure was intended to bring about an exploitation of younger age groups of whitefish where the bulk of biomass lies, elicit a further increase in growth, and a decrease in age of maturity and increase the catch per unit of effort (CPE). The effects of the mesh change on the whitefish population(s) is being closely monitored and quotas will be adjusted accordingly until the optimum level of exploitation is attained. In addition, the 1977 quota for whitefish and trout was lowered from 4.785 million pounds (2175 tonnes) to 3.4 million pounds (1546 tonnes). This was intended to protect the whitefish populations from over-exploitation which could result with the anticipated increase in CPE. A new licencing policy and limited entry into the fishery has been implemented. Persons wishing to enter the fishery apply through the Department of Fisheries and Oceans. Applications are reviewed by the Great Slave Lake Advisory Committee consisting of two representatives of the Fishermen's Federation, one from the NWT Tourist Industry Association, two from the Department of Fisheries and Oceans, and two from the Government of the Northwest Territories. The Board meets twice annually; spring and fall. The decision for new entrants into the fishery is based on a point system which takes into account residency, fishing experience and family history in the fishery.

During 1980, two components (fish plant sampling and experimental netting) of the program were carried out. This report summarizes, in tabular form, the data gathered from the fish plant sampling. Data from the 1980 experimental netting will be combined and published with the 1981 data.

MATERIALS AND METHODS

STUDY AREA

Great Slave Lake lies in the southwest corner of the District of Mackenzie, Northwest Territories (Fig. 1). It is the fifth largest lake in North America, having a surface area of 27,195 km^2 and a drainage area of 985,300 km^2. Stretching 440 km from its extreme east end to the outlet of the

Mackenzie River, the lake straddles two physiographic regions. The northeast shore of the north arm and the east arm lie within the Precambrian Shield and have irregular, precipitous margins. The western portion of the lake overlies the alluvial plain known as the Mackenzie Lowlands and has few islands and gently sloping shores. The rivers entering the lake from the Shield are cold, clear and rapidly flowing while those entering from the south are slow flowing, brown water streams laden with silt during spring and early summer. While the western basin has a maximum depth of about 165 m and a mean depth of 42 m, a depth of 625 m has been recorded in the east arm. Physical and biological characteristics of the lake have been described previously in detail by Rawson (1950, 1951, 1953a, b).

DESCRIPTION OF THE FISHERY

Great Slave Lake has been fished commercially since 1945. During the 1950's annual production of whitefish and trout averaged 6.5 million pounds (2955 metric tonnes) as the large accumulated stock was exploited. Since the 1950's commercial production of both species has decreased annually and whitefish and trout have reacted differently to exploitation (Keleher 1972). The west end of the lake is now being managed for whitefish production with minimal regard to lake trout which have been unable to withstand commercial gillnetting. Other than the mesh change in 1977 from 5 1/2 in (140 mm) to 5 1/4 in (133 mm), gillnets of 5 1/2 in (140 mm) stretched mesh have been the sole means of exploitation with no restriction on number of nets since 1961. During its history almost the entire lake has been open to commercial fishing although certain areas have been closed to protect Indian subsistence and sport fishing (Fig. 1 and Northwest Territories Fishery Regulations 1979). The east arm of Great Slave Lake (Area VI) was closed to commercial fishing in 1974 and is being managed exclusively for Indian subsistence and sport fishing (Moshenko and Gillman 1978).

A minimum of 25 fish species occur in the lake (Keleher 1972) of which only five are of commercial importance. The major commercial species in decreasing order of importance are lake whitefish, *Coregonus clupeaformis* (Mitchill); lake trout, *Salvelinus namaycush* (Walbaum); inconnu, *Stenodus leucichthys* (Pallas); northern pike, *Esox lucius* (Linnaeus) and walleye (pickerel), *Stizostedion vitreum vitreum* (Mitchill). Cisco, *Coregonus* spp.; burbot, *Lota lota* (Linnaeus); and longnose sucker, *Catostomus catostomus* (Forster) may constitute up to 40% or more of the total species catch; however, they are culled on the lake due to lack of market demand.

For the management of the commercial fishery the lake is divided into six administrative areas and a portion of the total annual quota of 3,700,000 (1,678 metric tonnes) round weight of whitefish and trout is allotted to each area (Table 1). The annual quota is based on the period commencing 1 November and terminating on the following 31 October and applies to the combined catch for both the winter and summer fishery. More detailed histories of the commercial fishery on Great Slave Lake are discussed by Kennedy (1956), Keleher (1972), and Bond and Turnbull (1973). The description of the winter and summer fisheries is summarized by Moshenko et al. (1978).

During the 1980 season, summer production (whitefish and trout) made up 71.6% of the total.

Winter and summer prices, (¢/lb) to fishermen, basis loose fish, F.O.B. Hay River Plant are shown below:

Species and Form	Winter 1979-80 fresh	Winter 1979-80 fresh	Winter 1979-80 frozen	Summer 1980 fresh
Whitefish (dressed)				
export smokers	52[a]	65[b]	39	53
jumbo (>4 lb)	62	75	47	55
large (3-4 lb)	52	65	39	48
medium (1¼-3 lb)	47	60	35	40
small (1-1¼ lb)	32	40	24	30
Lake trout				
dressed - medium (4-8 lb)	55	52	-	53
- small (2-4 lb)	40	39	-	38
headless dressed (8 lb)	60	42	-	58
Pickerel				
round	92	102	-	70
headless dressed	107	112	-	98
Northern pike				
head-on dressed (2-4 lb)	26	22	20	-
(4-9 lb)	32	42	24	24
headless dressed (>3/4 lb)	26	22	20	28
Inconnu				
headless dressed	37	30	28	25.5
Mullets				
headless	-	10	-	11
round	-	-	7	-

[a] Price effective November 1, 1979 (all prices in column).

[b] Price effective February 17, 1980 (all prices in column).

In addition, final payments (¢/lb) were provided to fishermen for the fish produced during the summer of 1979 and winter of 1979-80 (ending 30 April 1980) as follows:

Species and Form	Summer	Winter
Whitefish (dressed)		
small	6	11
medium	1.5	6.5
large	6	11
Trout	2.5	7.5
Pickerel		
round	25	30
dressed	30.5	-
headless dressed	39.5	44.5
Inconnu	12.5	17.5

Source: Freshwater Fish Marketing Corporation, Newsletter 1980

FISH PLANT SAMPLING

Monthly summaries of the landings by administrative area of five commercial species were com-

piled from the Freshwater Fish Marketing Corporation (FFMC) sales slips by Fisheries and Oceans staff in Hay River. Production figures are presented in pounds round weight. The following lists the factors used to convert various species and forms to round weight (Keleher 1964):

Species	Form	Conversion Factor
Whitefish	dressed	x 1.17
Pickerel	dressed	x 1.22
	headless	x 1.39
Trout	dressed	x 1.21
	headless	x 1.53
Pike	dressed	x 1.22
	headless	x 1.53
Inconnu	dressed	x 1.16
	headless	x 1.35

Production values presented in this report (Tables 2 and 3) include whitefish culls at the plant but do not include an estimate of cull discarded on the lake due to deterioration following extended periods in the nets (usually the result of storms). Fishermen cull these fish as the nets are lifted. Fish which do not meet the market size and quality requirements are further culled by graders at the fish plant and the weight is recorded on the sales slip. Cullage on the lake was not subtracted from the quota this season. It will be subtracted from the lake quota when management programs provide a good estimate of lake cullage. Production data and mesh size are given in the English measurements (pounds and inches) since these are used in the Northwest Territories Fishery Regulations.

Commercial landings of whitefish were sampled at each of the four fish plants: Hay River, Moraine Bay, Wool Bay and Simpson Islands (Fig. 1). A minimum of 300 dressed (head-on) whitefish were sampled each month during the summer season from Areas IE (Hay River), II (Moraine Bay), IV (Wool Bay) and V (Simpson Islands). In addition, whitefish were sampled from Area IW in December 1979, February and June 1980. Whitefish from Area III were not sampled this year due to limited production. Boxes of fish were selected at random from the catches of the various fishermen as they arrived at the plant. All whitefish in the box, up to a maximum of 75 fish per individual fisherman, were sampled. Thus, the sample of 300 whitefish would have been taken from at least four different fishermen. Fork length (±1 mm), dressed weight (±50 g) and scales were taken from the left side from the area just above the lateral line and the dorsal fin.

DATA ANALYSIS

Catch per unit of effort (CPE)

Number of vessel deliveries and whitefish landings (production in pounds round weight) by weekly intervals for each administrative area (Table 5) were calculated as follows:

i) Compiled the number of deliveries/fisherman (operator)/week from FFMC sales slip for each administrative area.

ii) Separated data by vessel type: skiff (Class B) and whitefish boat (Class A).

iii) Calculated weekly totals for each vessel type.

iv) Tabulated number of deliveries per weekly period for each administrative area and all areas combined.

v) Tabulated weekly production values from FFMC sales slips and converted to round weight by multiplying by the factor 1.17 (Keleher 1964).

Total whitefish production, estimates for total number of nets used and CPE (pounds round weight/100 yd/24 h) by weekly intervals (Tables 6-12) were calculated as follows:

i) Weekly whitefish production by area was tallied from the FFMC sales slips and converted to round weight.

ii) The number of lifts/week/area were tallied from FFMC sales slips with each delivery treated as one lift. The data were calculated separately for skiffs (Class B) and whitefish boats (Class A).

iii) It was determined from the 1979 fishery observations that the average number of nets used by the various vessel types was as follows: 18 nets for skiffs and 71 nets for whitefish boats (Moshenko and Low 1980). Fishery observations also showed that skiffs usually lifted all nets each day while most whitefish boats lifted only half of the nets each day, weather permitting. Thus, for whitefish boats each lift represents a set time (nets down) of at least 48 hours. Since CPE is in pounds round weight/100 yd/24 h, the following calculations were made to correct this:

net factor (NF) = (% of total nets lifted/day) multiplied by (number of 24 h periods nets were down)

Thus, net factors (NF) for the various vessel types were as follows:

skiffs = (100% x 18 nets) (1 period) = 18

whitefish boats = (50% x 71 nets) (2 periods) = 71

iv) The number of nets used was calculated by multiplying the appropriate net factor (NF) by the number of weekly lifts/vessel type and combining the totals.

v) CPE (pounds round weight/100 yd/24 h) was calculated by dividing production by the number of nets.

Biological data

The scale age was determined by counting the number of completed annuli. Thus, an age 10 fish was in its eleventh year.

Dressed weights for whitefish shown in Table 15 may be converted to approximate round weights by multiplying by a factor of 1.17 (Keleher 1964).

Annual mortality rates (natural and fishing) were calculated using the method (all ages known) outlined by Robson and Chapman (1961). The total annual mortality is defined as the number of fish which die during a year divided by the initial number (Ricker 1975). Thus, if the mortality rate were 60%, then among the larger fish beyond the age where they are fully vulnerable to the fishery, out of every 100 fish alive at a given time 60 are expected to die during the next year. The right hand descending portion of a catch curve may be used to estimate annual mortality rates if the following assumptions can be met:

i) constant survival or mortality rates over the range of age-classes, and with time;

ii) constant year-class strength (even recruitment), and

iii) all fish beyond some age are equally vulnerable to the harvesting gear.

Ricker (1975) indicated that the modal age in the catch curve will commonly lie quite close to the first year in which recruitment can be considered effectively complete. Recruitment is defined as the addition of new fish to the vulnerable population by growth among small size categories. In our calculations, we first selected the modal age-class and then chose the next older age-class to be sure that all fish beyond this age are at the age of effectively complete recruitment and fully susceptible to the gear.

The majority of the data collected during the study were analyzed using the computer facilities at the University of Manitoba as well as a Hewlett-Packard (model 9810-A) programmable calculator.

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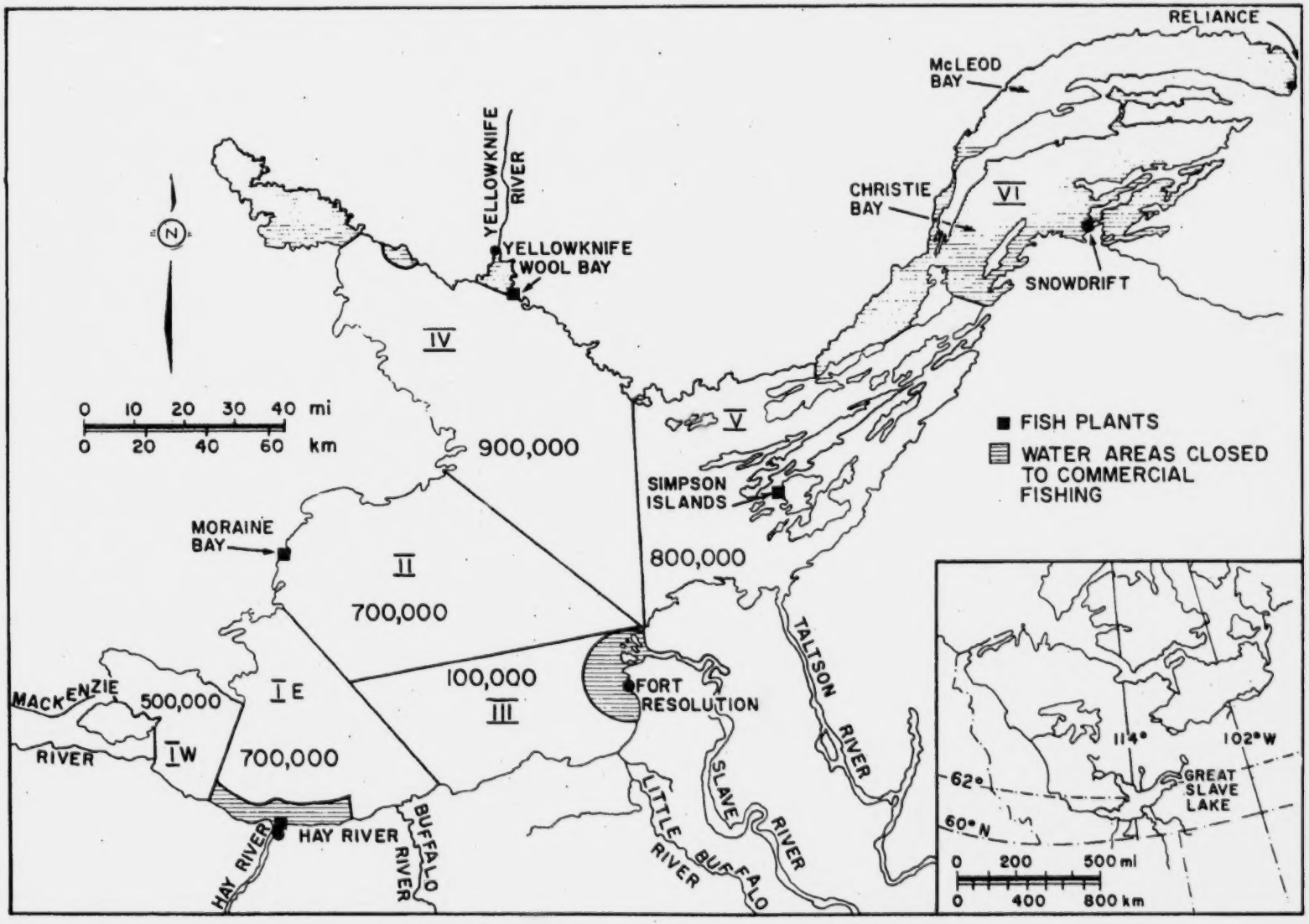

Fig. 1. Map of Great Slave Lake showing the administrative areas and quotas (pounds round weight) in effect during 1980, areas closed to commercial fishing and the location of fish plants.

Table 1. Commercial quotas in effect on Great Slave Lake during the 1976 to 1980 seasons.

Administrative Area	Commercial quota of whitefish and lake trout (pounds round weight)			
	1976[a]	1977,1978[b]	1979[c]	1980[d]
IW (winter only)[e]	500,000	500,000	500,000	500,000
IE	700,000	700,000	700,000	700,000
II	1,500,000	700,000	700,000	700,000
III	-	-	100,000	100,000
IV	1,370,000	900,000	900,000	900,000
V	715,000	600,000	650,000	800,000
Total	4,785,000	3,400,000	3,550,000	3,700,000

[a] November 1, 1975 - October 31, 1976.

[b] November 1, 1976 - October 31, 1978.

[c] November 1, 1978 - October 31, 1979.

[d] November 1, 1979 - October 31, 1980.

[e] Area IW was opened to summer fishing 1979 and 1980 for the balance of the quota.

Table 2. Total production of commercial species (pounds round weight) by administrative areas, 1980.

Species	Production from each administrative area						Total
	IW	IE	II	III	IV	V	
Whitefish	461,071	449,815	517,467	17,743	698,182	451,782	2,596,060
Trout	5,997	21,078	8,529	-	5,706	226,652	267,962
Pike	192,052	38,325	34,373	16,601	45,666	112,663	439,680
Inconnu	6,279	89,163	820	2,221	3,584	41,196	143,263
Walleye	1,995	3,605	54	751	2,045	32,442	40,892
Total	667,394	601,986	561,243	37,316	755,183	864,735	3,487,857

Table 3. Production of whitefish and trout (pounds round weight) from each administrative area for winter and summer seasons, 1980.

Administrative Area	Winter		Summer		Total		Total
	Whitefish	Trout	Whitefish	Trout	Whitefish	Trout	
IW	389,821	2,109	71,250	3,888	461,071	5,997	467,068
IE	5,878	-	443,937	21,078	449,815	21,078	470,893
II	59,527	545	457,940	7,984	517,467	8,529	525,996
III	161	-	17,582	-	17,743	-	17,743
IV	174,631	494	523,551	5,212	698,182	5,706	703,888
V	129,793	50,315	321,989	176,337	451,782	226,652	678,434
Total	759,811	53,463	1,836,249	214,499	2,596,060	267,962	2,864,022

Table 4. Information on vehicle and vessel operations, number of men and number of nets used in the Great Slave Lake commercial fishery, winter 1979-80 and summer 1980.

Winter Fishery[a] (November - May):

	Number of licences issued	Number of vehicles producing	Total no. of men	Number of men/vehicle	Number of nets/vehicle
bombardier	Class A 27	26	65	2.5	30
skidoo	Class B 23	7	10	1.4	15
Total	50	33	75	-	-

Summer Fishery[b] (June - October):

	Number of licences issued	Number of vehicles producing	Total no. of men	Number of men/vehicle	Number of nets/vehicle
skiffs	Class B 49	37	55	1.5	24
bowpickers	Class A 4	2	4	2.0	30
whitefish boats	Class A 23	20	76	3.8	71
Total	76	59	135	-	-

[a] Information obtained from Conservation and Protection records, Hay River.

[b] Last three columns based on 1979 fishery observation records.

Table 5. Number of vessel deliveries and whitefish landings (production in pounds round weight) by weekly intervals for each administrative area, summer 1980.

Week Ending	June				July				August				
	8	15	22	29	6	13	20	27	3	10	17	24	31
AREA IE													
Class A	6	10	11	16	15	12	12	20	20	20	25	29	20
Class B	15	13	14	17	21	32	26	30	25	25	39	26	18
Production	1652	3632	10812	14176	16655	17349	25115	46704	40000	64216	65975	42407	15096
AREA IW													
Class A	6	17	18	-	-	-	-	-	-	-	-	-	-
Class B	4	7	7	-	-	-	-	-	-	-	-	-	-
Production	6632	28742	35876	-	-	-	-	-	-	-	-	-	-
AREA II													
Class A	-	-	-	5	31	36	20	31	30	19	30	31	15
Class B	-	-	-	1	-	1	0	2	-	0	0	0	0
Production	-	-	-	5731	35413	54645	31150	65407	65407	33726	46288	53932	11368
AREA III													
Class A	-	-	2	-	-	-	-	-	-	-	-	-	-
Class B	-	-	-	-	-	-	-	-	-	-	-	-	-
Production	-	-	855	-	-	-	-	-	-	-	-	-	-
AREA IV													
Class A	2	4	8	13	16	27	15	28	12	8	15	26	20
Class B	-	4	3	5	11	16	5	21	10	9	23	37	26
Production	3757	6948	16715	18877	29023	30689	14176	68343	30634	12321	32049	43371	39429
AREA V													
Class A	-	-	-	-	4	6	7	7	6	3	1	4	2
Class B	-	-	-	-	15	7	13	25	15	12	13	36	37
Production	-	-	-	-	5260	6785	7585	29340	13553	6334	5680	18064	18811
ALL AREAS													
Class A	14	31	39	34	66	81	54	86	68	50	71	90	57
Class B	19	24	24	23	47	56	44	78	51	46	75	89	81
Production	12041	39322	64258	38784	86351	109468	78026	209794	149594	116597	149992	157774	84704

Table 5. Continued.

Week Ending	September 7	14	21	28	October 5	12	19	26	Total
AREA IE									
Class A	5	4	19	4	5	-	1	4	258
Class B	13	23	26	10	7	5	7	27	419
Production	7346	8585	26695	8989	4080	8584	5260	10609	443937
AREA IW									
Class A	-	-	-	-	-	-	-	-	41
Class B	-	-	-	-	-	-	-	-	18
Production	-	-	-	-	-	-	-	-	71250
AREA II									
Class A	15	23	12	-	-	-	-	-	298
Class B	0	0	-	-	-	-	-	-	5
Production	12353	31941	10579	-	-	-	-	-	457940
AREA III									
Class A	-	-	-	-	-	0	2	1	5
Class B	-	-	-	-	-	10	12	16	38
Production	-	-	-	-	-	1065	6478	9184	17582
AREA IV									
Class A	23	18	16	15	5	-	-	-	271
Class B	17	22	21	8	3	-	-	-	231
Production	27150	40651	32391	54016	23011	-	-	-	523551
AREA V									
Class A	15	22	30	31	14	-	-	-	152
Class B	47	49	40	35	19	-	-	-	363
Production	49732	43462	52683	40688	24012	-	-	-	321989
ALL AREAS									
Class A	58	67	77	50	24	-	3	5	1025
Class B	77	94	87	53	29	15	19	43	1074
Production	96581	124639	122348	103693	51103	9649	11738	19793	1836249

Table 6. Total whitefish production, estimates for total number of nets used and CPE by weekly intervals for Area IE.

Week Ending	Production (lb round wt)	Number of nets used[a] (100 yd each)	CPE (lb/100 yd/24 h)[b]
June 8	1,652	696	2.4
15	3,632	944	3.8
22	10,812	1,033	10.5
29	14,176	1,442	9.8
Total	30,272	4,115	7.4
July 6	16,655	1,443	11.5
13	17,349	1,428	12.2
20	25,115	1,320	19.0
27	46,704	1,960	23.8
Total	105,823	6,151	17.2
Aug. 3	40,000	1,870	21.4
10	64,216	1,870	34.3
17	65,975	2,477	26.6
24	42,407	2,527	16.8
31	15,096	1,744	8.7
Total	227,694	10,488	21.7
Sept. 7	7,346	589	12.5
14	8,585	698	12.3
21	26,695	1,817	14.7
28	8,989	464	19.4
Total	51,615	3,568	14.5
Oct. 5	4,080	481	8.5
12	8,584	90	95.4
19	5,260	197	26.7
26	10,609	770	13.8
Total	28,533	1,538	18.6
Season Total	433,937	25,860	17.2

[a] Refer to materials and methods for calculation.

[b] Round weight.

Table 7. Total whitefish production, estimates for total number of nets used and CPE by weekly intervals for Area II.

Week Ending	Production (lb round wt)	Number of nets used[a] (100 yd each)	CPE (lb/100 yd/24 h)[b]
June 29	5,731	373	15.4
Total	5,731	373	15.4
July 6	35,413	2,201	16.1
13	54,645	2,574	21.2
20	31,150	1,420	21.9
27	65,407	2,237	29.2
Total	186,615	8,432	22.1
Aug. 3	65,407	2,148	30.4
10	33.726	1,349	25.0
17	46,288	2,130	21.7
24	53,932	2,201	24.5
31	11,368	1,065	10.7
Total	210,721	8,893	23.7
Sept. 7	12,353	1,065	11.6
14	31,941	1,633	19.6
21	10,579	852	12.4
Total	54,873	3,550	15.5
Season Total	457,940	21,248	21.6

[a] Refer to materials and methods for calculation.

[b] Round weight.

Table 8. Total whitefish production, estimates for total number of nets used and CPE by weekly intervals for Area IV.

Week Ending	Production (lb round wt)	Number of nets used[a] (100 yd each)	CPE (lb/100 yd/24 h)[b]
June 8	3,757	142	26.5
15	6,948	356	19.5
22	16,715	622	26.9
29	18,877	1,013	18.6
Total	46,297	2,133	21.7
July 6	29,023	1,334	21.8
13	30,689	2,205	13.9
20	14,176	1,155	12.3
27	68,343	2,366	28.9
Total	142,231	7,060	20.2
Aug. 3	30,634	1,032	29.7
10	12,321	730	16.9
17	32,049	1,479	21.7
24	43,371	2,332	18.6
31	39,429	1,888	20.9
Total	157,804	7,461	21.2
Sept. 7	27,150	1,939	14.0
14	40,651	1,674	24.3
21	32,391	1,514	21.4
28	54,016	1,209	44.7
Total	154,208	6,336	24.3
Oct. 5	23,011	409	56.3
Total	23,011	409	56.3
Season Total	523,551	23,399	22.4

[a] Refer to materials and methods for calculation.

[b] Round weight.

Table 9. Total whitefish production, estimates for total number of nets used and CPE by weekly intervals for Area V.

Week Ending	Production (lb round wt)	Number of nets used[a] (100 yd each)	CPE (lb/100 yd/24 h)[b]
July 6	5,260	554	9.5
13	6,785	552	12.3
20	7,585	731	10.4
27	29,340	947	30.9
Total	48,970	2,784	17.6
Aug. 3	13,553	696	19.5
10	6,334	429	14.8
17	5,680	305	18.6
24	18,064	932	19.4
31	18,811	808	23.3
Total	62,442	3,170	19.7
Sept. 7	49,732	1,911	26.0
14	43,462	2,444	17.8
21	52,683	2,850	18.5
28	40,688	2,831	14.4
Total	186,565	10,036	18.6
Oct. 5	24,012	1,336	18.0
Total	24,012	1,336	18.0
Season Total	321,989	17,326	18.9

[a] Refer to materials and methods for calculation.

[b] Round weight.

Table 10. Total whitefish production, estimates for total number of nets used and CPE by weekly intervals for Area III.

Week Ending	Production (lb round wt)	Number of nets used[a] (100 yd each)	CPE (lb/100 yd/24 h)[b]
June 22	855	142	6.0
Total	855	142	6.0
Oct. 12	1,065	180	5.9
19	6,478	358	18.1
26	9,184	359	25.6
Total	16,727	897	18.7
Season Total	17,582	1,039	16.9

[a] Refer to materials and methods for calculation.

[b] Round weight.

Table 11. Total whitefish production, estimates for total number of nets used and CPE by weekly intervals for Area IW.

Week Ending	Production (lb round wt)	Number of nets used[a] (100 yd each)	CPE (lb/100 yd/24 h)[b]
June 8	6,632	498	13.3
15	28,742	1,333	21.6
22	35,876	1,404	25.6
Total	71,250	3,235	22.0
Season Total	71,250	3,235	22.0

[a] Refer to materials and methods for calculation.

[b] Round weight.

Table 12. Total whitefish production, estimates for total number of nets used and CPE by weekly intervals for all areas.

Week Ending	Production (lb round wt)	Number of nets used[a] (100 yd each)	CPE (lb/100 yd/24 h)[b]
June 8	12,041	1,336	9.0
15	39,322	2,633	14.9
22	64,258	3,201	20.1
29	38,784	2,738	14.2
Total	154,405	9,908	15.6
July 6	86,351	5,532	15.6
13	109,468	6,759	16.2
20	78,026	4,626	16.9
27	209,794	7,510	27.9
Total	483,639	24,427	19.8
Aug. 3	149,594	5,746	26.0
10	116,597	4,378	26.6
17	149,992	6,391	23.5
24	157,774	7,992	19.7
31	84,704	5,505	15.4
Total	658,661	30,012	22.0
Sept. 7	96,581	5,504	17.6
14	124,639	6,449	19.3
21	122,348	7,033	17.4
28	103,693	4,504	23.0
Total	447,261	23,490	19.0
Oct. 5	51,103	2,226	23.0
12	9,649	270	35.7
19	11,738	555	21.2
26	19,793	1,129	17.5
Total	92,283	4,180	22.1
Season Total	1,836,249	92,017	20.0

[a] Refer to materials and methods for calculation.

[b] Round weight.

Table 13. Weight composition by market weight intervals for lake whitefish from commercial plant samples on Great Slave Lake, 1980.

Market Weight Interval (Dressed)	Area IE		Area II		Area IV		Area V		Area IW		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No market (0-1 lb, 0-454 g)	8	<1	12	1	6	<1	1	<1	-	-	27	<1
Small (1-1½ lb, 455-681 g)	69	5	77	8	85	8	23	2	11	2	265	6
Medium (1½-3 lb, 682-1362 g)	1073	84	835	89	893	88	884	95	513	78	4198	87
Large (3-4 lb, 1363-1816 g)	125	10	12	1	25	2	20	2	112	17	294	6
Jumbo (>4 lb, 1816 g)	8	<1			5	<1	<1	<1	24	4	38	<1
Total	1283	-	936	-	1014	-	929	-	660	-	4822	-

Table 14. Mean fork lengths (mm) of commercial whitefish from each area by month periods, 1980 (including December 1979).

	December (1979)	February	June	July	August	September	October	Total
AREA IE								
N	-	-	313	334	317	-	319	1283
$\bar{X}$	-	-	411	413	460	-	404	422
SD	-	-	28.9	31.2	33.2	-	22.6	36.6
AREA II								
N	-	-	-	310	312	314	-	936
$\bar{X}$	-	-	-	414	406	395	-	405
SD	-	-	-	23.9	25.4	27.9	-	27.0
AREA IV								
N	-	-	100	301	314	299	-	1014
$\bar{X}$	-	-	396	404	408	409	-	406
SD	-	-	22.7	34.7	32.3	23.5	-	30.0
AREA V								
N	-	-	-	309	312	308	-	929
$\bar{X}$	-	-	-	429	415	421	-	421
SD	-	-	-	28.1	20.9	20.2	-	24.0
AREA IW								
N	195	148	317	-	-	-	-	660
$\bar{X}$	426	424	463	-	-	-	-	443
SD	26.3	29.5	41.1	-	-	-	-	39.5

Table 15. Mean dressed weights (g) of commercial whitefish from each area by month periods, 1980 (including December 1979).

	December (1979)	February	June	July	August	September	October	Total
AREA IE								
N	-	-	313	334	317	-	319	1283
$\bar{X}$	-	-	913	954	1267	-	835	992
SD	-	-	195.0	209.1	260.8	-	148.7	263.9
AREA II								
N	-	-	-	310	312	314	-	936
$\bar{X}$	-	-	-	946	901	821	-	889
SD	-	-	-	172.2	168.1	163.9	-	175.8
AREA IV								
N	-	-	100	301	314	299	-	1014
$\bar{X}$	-	-	819	903	905	905	-	896
SD	-	-	129.8	258.2	226.8	157.7	-	212.7
AREA V								
N	-	-	-	309	312	308	-	929
$\bar{X}$	-	-	-	1006	917	918	-	947
SD	-	-	-	210.9	144.7	136.2	-	172.2
AREA IW								
N	195	148	317	-	-	-	-	660
$\bar{X}$	1016	1013	1304	-	-	-	-	1154
SD	191.9	216.3	322.5	-	-	-	-	308.7

Table 16. Age composition of commercial whitefish from each area summer 1980 and winter sample from Area IW.

Age Group (yr)	Area IE		Area II		Area IV		Area V		Area IW		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
5	1	0.1	1	0.1	-	-	-	-	1	0.2	3	0.1
6	7	0.6	26	2.9	2	0.2	5	0.6	8	1.3	48	1.1
7	26	2.2	94	10.5	16	1.7	11	1.3	23	3.8	170	3.8
8	49	4.1	128	14.3	47	5.0	25	2.8	57	9.5	306	6.8
9	235	19.9	245	27.3	189	20.1	80	9.1	121	20.2	870	19.3
10	394	33.3	292	32.6	294	31.2	135	15.3	151	25.2	1266	28.1
11	259	21.9	86	9.6	249	26.5	244	27.6	79	13.2	917	20.4
12	127	10.7	21	2.3	106	11.3	202	22.9	65	10.9	521	11.6
13	48	4.1	3	0.3	24	2.6	116	13.1	43	7.2	234	5.2
14	27	2.3	-	-	9	1.0	51	5.8	23	3.8	110	2.4
15	8	0.7	-	-	4	0.4	12	1.4	9	1.5	33	0.7
16	1	0.1	-	-	-	-	2	0.2	10	1.7	13	0.3
17	2	0.2	-	-	1	0.1	-	-	6	1.0	9	0.2
20	-	-	-	-	-	-	-	-	3	0.5	3	0.7
Total	1184		896		941		883		599		4503	
Mean Age	10.3		9.2		10.3		11.2		10.4		10.3	

Table 17. Age composition of commercial whitefish for each month period from Area IW, December 1979, February and June 1980.

Age Group (yr)	December		February		June		Total	
	No.	%	No.	%	No.	%	No.	%
5	1	0.5	-	-	-	-	1	0.2
6	7	3.8	-	-	1	0.4	8	1.3
7	14	7.6	2	1.5	7	2.5	23	3.8
8	39	21.2	8	5.8	10	3.6	57	9.5
9	71	38.6	22	15.9	28	10.1	121	20.2
10	33	17.9	52	37.7	66	23.8	151	25.2
11	11	6.0	22	15.9	46	16.6	79	13.2
12	7	3.8	17	12.3	41	14.8	65	10.9
13	1	0.5	10	7.3	32	11.6	43	7.2
14	-	-	4	2.9	19	6.9	23	3.8
15	-	-	1	0.7	8	2.9	9	1.5
16	-	-	-	-	10	3.6	10	1.7
17	-	-	-	-	6	2.2	6	1.0
18	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-
20	-	-	-	-	3	1.0	3	0.5
Total	184		138		277		599	
Mean Age	8.9		10.5		11.4		10.4	

Table 18. Age composition of commercial whitefish for each month period from Area IE, 1980.

Age Group (yr)	June		July		August		October		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
5	-	-	-	-	-	-	1	0.3	1	0.1
6	-	-	1	0.3	4	1.4	2	0.7	7	0.6
7	3	1.0	2	0.6	7	2.5	14	4.7	26	2.2
8	11	3.8	1	0.3	14	5.0	23	7.7	49	4.1
9	50	17.2	56	17.9	47	16.7	82	27.4	235	19.9
10	91	31.4	114	36.4	68	24.1	121	40.5	394	33.3
11	67	23.4	82	26.2	63	22.3	47	15.7	259	21.9
12	40	13.8	41	13.1	39	13.8	7	2.3	127	10.7
13	17	5.9	10	3.2	19	6.7	2	0.7	48	4.1
14	7	2.4	6	1.9	14	5.0	-	-	27	2.3
15	2	0.7	-	-	6	2.1	-	-	8	0.7
16	1	0.3	-	-	-	-	-	-	1	0.1
17	1	0.3	-	-	1	0.4	-	-	2	0.2
Total	290		313		282		299		1184	
Mean Age	10.6		10.5		10.6		9.6		10.3	

Table 19. Age composition of commercial whitefish for each month period from Area II, 1980.

Age Group (yr)	July		August		September		Total	
	No.	%	No.	%	No.	%	No.	%
5	-	-	-	-	1	0.3	1	0.1
6	3	1.0	4	1.4	19	6.3	26	2.9
7	13	4.3	20	6.9	61	20.1	94	10.5
8	25	8.2	35	12.1	68	22.4	128	14.3
9	83	27.3	91	31.5	71	23.4	245	27.3
10	124	40.8	101	35.0	67	22.1	292	32.6
11	45	14.8	28	9.7	13	4.3	86	9.6
12	9	3.0	9	3.1	3	1.0	21	2.3
13	2	0.7	1	0.4	-	-	3	0.3
Total	304		289		303		896	
Mean Age	9.6		9.3		8.5		9.2	

Table 20. Age composition of commercial whitefish for each month period at Area IV, 1980.

Age Group (yr)	June		July		August		September		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
6	-	-	1	0.4	1	0.3	-	-	2	0.2
7	-	-	6	2.2	9	3.1	1	0.3	16	1.7
8	1	0.1	20	7.5	23	7.8	3	1.0	47	5.0
9	9	10.2	75	28.0	60	20.3	45	15.5	189	20.1
10	25	28.4	82	30.6	81	27.5	106	36.6	294	31.2
11	32	36.4	53	19.8	77	26.1	87	30.0	249	26.5
12	12	13.6	21	7.8	35	11.9	38	13.1	106	11.3
13	8	9.1	6	2.2	7	2.4	3	1.0	24	2.6
14	-	-	3	1.1	1	0.3	5	1.7	9	1.0
15	1	1.1	1	0.4	1	0.3	1	0.3	4	0.4
16	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	1	0.3	1	0.1
Total	88		268		295		290		941	
Mean Age	10.8		10.0		10.1		10.5		10.3	

Table 21. Age composition of commercial whitefish for each month period from Area V, 1980.

Age Group (yr)	July		August		September		Total	
	No.	%	No.	%	No.	%	No.	%
6	-	-	4	1.4	1	0.3	5	0.6
7	2	0.7	4	1.4	5	1.7	11	1.3
8	7	2.4	15	5.1	3	1.0	25	2.8
9	26	8.7	29	9.9	25	8.6	80	9.1
10	56	18.8	42	14.3	37	12.7	135	15.3
11	82	27.5	82	28.0	80	27.4	244	27.6
12	67	22.5	63	21.5	72	24.7	202	22.9
13	35	11.7	36	12.3	45	15.4	116	13.1
14	18	6.0	15	5.1	18	6.2	51	5.8
15	4	1.3	2	0.7	6	2.1	12	1.4
16	1	0.3	1	0.3	-	-	2	0.2
Total	298		293		292		883	
Mean Age	11.3		11.0		11.4		11.2	

Table 22. Length composition of commercial whitefish from each area summer 1980 and from Area IW in December 1979, February and June 1980.

Length Interval (mm)	Area IE		Area II		Area IV		Area V		Area IW		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
300 - 309	2	0.2	-	-	1	0.1	-	-	-	-	3	<0.1
310 - 319	3	0.2	2	0.2	1	0.1	-	-	-	-	6	0.1
320 - 329	-	-	4	0.4	3	0.3	-	-	-	-	7	0.2
330 - 339	2	0.2	10	1.1	6	0.6	1	0.1	-	-	19	0.4
340 - 349	4	0.3	15	1.6	8	0.8	4	0.4	4	0.6	35	0.7
350 - 359	17	1.3	19	2.0	21	2.1	4	0.4	2	0.3	63	1.3
360 - 369	31	2.4	40	4.3	42	4.1	3	0.3	1	0.2	117	2.4
370 - 379	54	4.2	55	5.9	76	7.5	15	1.6	10	1.5	210	4.4
380 - 389	105	8.2	74	7.9	128	12.6	37	4.0	15	2.3	359	7.5
390 - 399	137	10.7	146	15.6	139	13.7	71	7.6	34	5.2	527	10.9
400 - 409	162	12.6	163	17.4	136	13.4	137	14.8	51	7.7	649	13.5
410 - 419	182	14.2	136	14.5	151	14.9	168	18.1	68	10.3	705	14.6
420 - 429	136	10.6	109	11.7	105	10.4	170	18.3	79	12.0	599	12.4
430 - 439	95	7.4	80	8.6	84	8.3	135	14.5	69	10.5	463	9.6
440 - 449	68	5.3	40	4.3	40	3.9	79	8.5	80	12.2	307	6.4
450 - 459	58	4.5	25	2.7	31	3.1	48	5.2	54	8.2	216	4.5
460 - 469	65	5.1	10	1.1	7	0.7	23	2.5	52	7.9	157	3.3
470 - 479	48	3.7	4	0.4	13	1.3	18	1.9	27	4.1	110	2.3
480 - 489	54	4.2	3	0.3	11	1.1	7	0.8	24	3.6	99	2.1
490 - 499	26	2.0	1	0.1	1	0.1	2	0.2	15	2.3	45	0.9
500 - 509	15	1.2	-	-	3	0.3	4	0.4	18	2.7	40	0.8
510 - 511	7	0.6	-	-	3	0.3	3	0.3	19	2.9	32	0.7
520 - 529	6	0.5	-	-	1	0.1	-	-	18	2.7	25	0.5
530 - 539	3	0.2	-	-	1	0.1	-	-	10	1.5	14	0.3
540 - 549	2	0.2	-	-	1	0.1	-	-	6	0.9	9	0.2
550 - 559	1	0.1	-	-	1	0.1	-	-	3	0.5	5	0.1
560 - 569	-	-	-	-	-	-	-	-	-	-	-	-
570 - 579	-	-	-	-	-	-	-	-	-	-	-	-
580 - 589	-	-	-	-	-	-	-	-	-	-	-	-
590 - 599	-	-	-	-	-	-	-	-	1	0.2	1	<0.1
Total	1283		936		1014		929		660		4822	
Mean Length	422		405		406		421		443		418.2	

Table 23. Length composition of commercial whitefish for each month period from Area IW, December 1979, February and June, 1980.

Length Interval (mm)	December		February		June		Total	
	No.	%	No.	%	No.	%	No.	%
340 - 349	1	0.5	3	2.0	-	-	4	0.6
350 - 359	1	0.5	1	0.7	-	-	2	0.3
360 - 369	-	-	-	-	1	0.3	1	0.2
370 - 379	4	2.1	4	2.7	2	0.6	10	1.5
380 - 389	8	4.1	3	2.0	4	1.3	15	2.3
390 - 399	12	6.2	12	8.1	10	3.2	34	5.2
400 - 409	25	12.8	18	12.2	8	2.5	51	7.7
410 - 419	29	14.9	21	14.2	18	5.7	68	10.3
420 - 429	31	15.9	24	16.2	24	7.6	79	12.0
430 - 439	24	12.3	19	12.8	26	8.2	69	10.5
440 - 449	24	12.3	16	10.8	40	12.6	80	12.1
450 - 459	17	8.7	15	10.1	22	6.9	54	8.2
460 - 469	9	4.6	4	2.7	39	12.3	52	7.9
470 - 479	4	2.1	3	2.0	20	6.3	27	4.1
480 - 489	3	1.5	2	1.4	19	6.0	24	3.6
490 - 499	3	1.5	1	0.7	11	3.5	15	2.3
500 - 509	-	-	-	-	18	5.7	18	2.7
510 - 519	-	-	-	-	19	6.0	19	2.9
520 - 529	-	-	1	0.7	17	5.4	18	2.7
530 - 539	-	-	1	0.7	9	2.8	10	1.5
540 - 549	-	-	-	-	6	1.9	6	0.9
550 - 559	-	-	-	-	3	1.0	3	0.5
560 - 569	-	-	-	-	-	-	-	-
570 - 579	-	-	-	-	-	-	-	-
580 - 589	-	-	-	-	-	-	-	-
590 - 600	-	-	-	-	1	0.3	1	0.2
Total	195		148		317		660	
Mean Length	426		424		463		443	

Table 24. Length composition of commercial whitefish for each month period from Area IE, 1980.

Length Interval (mm)	June		July		August		October		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
300 - 309	2	0.6	-	-	-	-	-	-	2	0.2
310 - 319	-	-	1	0.3	-	-	2	0.6	3	0.2
320 - 329	-	-	-	-	-	-	-	-	-	-
330 - 339	1	0.3	1	0.3	-	-	-	-	2	0.2
340 - 349	2	0.6	1	0.3	-	-	1	0.3	4	0.3
350 - 359	5	1.6	7	2.1	1	0.3	4	1.3	17	1.3
360 - 369	12	3.8	11	3.3	1	0.3	7	2.2	31	2.4
370 - 379	14	4.5	14	4.2	2	0.6	24	7.5	54	4.2
380 - 389	27	8.6	36	10.8	3	1.0	39	12.2	105	8.2
390 - 399	41	13.1	40	12.0	7	2.2	49	15.4	137	10.7
400 - 409	47	15.0	50	15.0	9	2.8	56	17.6	162	12.6
410 - 419	56	17.9	45	13.5	21	6.6	60	18.8	182	14.2
420 - 429	40	12.8	40	12.0	21	6.6	35	11.0	136	10.6
430 - 439	23	7.4	32	9.6	19	6.0	21	6.6	95	7.4
440 - 449	21	6.7	14	4.2	17	5.4	16	5.0	68	5.3
450 - 459	11	3.5	21	6.3	24	7.6	2	0.6	58	4.5
460 - 469	5	1.6	5	1.5	53	16.7	2	0.6	65	5.1
470 - 479	1	0.3	4	1.2	42	13.3	1	0.3	48	3.7
480 - 489	1	0.3	5	1.5	48	15.1	-	-	54	4.2
490 - 499	1	0.3	2	0.6	23	7.3	-	-	26	2.0
500 - 509	1	0.3	2	0.6	12	3.8	-	-	15	1.2
510 - 519	1	0.3	1	0.3	5	1.6	-	-	7	0.6
520 - 529	-	-	1	0.3	5	1.6	-	-	6	0.5
530 - 539	-	-	1	0.3	2	0.6	-	-	3	0.2
540 - 549	1	0.3	-	-	1	0.3	-	-	2	0.2
550 - 559	-	-	-	-	1	0.3	-	-	1	0.1
Total	313		334		317		319		1283	
Mean Length	410		413		460		404		422	

Table 25. Length composition of commercial whitefish for each month period from Area II, 1980.

Length Interval (mm)	July		August		September		Total	
	No.	%	No.	%	No.	%	No.	%
310 - 319	-	-	-	-	2	0.6	2	0.2
320 - 329	1	0.3	-	-	3	1.0	4	0.4
330 - 339	1	0.3	-	-	9	2.9	10	1.1
340 - 349	1	0.3	3	1.0	11	3.5	15	1.6
350 - 359	1	0.3	10	3.2	8	2.6	19	2.0
360 - 369	4	1.3	13	4.2	23	7.3	40	4.3
370 - 379	11	3.6	18	5.8	26	8.3	55	5.9
380 - 389	14	4.5	28	9.0	32	10.2	74	7.9
390 - 399	47	15.2	44	14.1	55	17.5	146	15.6
400 - 409	55	17.7	63	20.2	45	14.3	163	17.4
410 - 419	51	16.4	45	14.4	40	12.7	136	14.5
420 - 429	48	15.5	28	9.0	33	10.5	109	11.7
430 - 439	37	11.9	25	8.0	18	5.7	80	8.6
440 - 449	19	6.1	18	5.8	3	1.0	40	4.3
450 - 459	7	2.3	14	4.5	4	1.3	25	2.7
460 - 469	8	2.6	1	0.3	1	0.3	10	1.1
470 - 479	3	1.0	-	-	1	0.3	4	0.4
480 - 489	1	0.3	2	0.6	-	-	3	0.3
490 - 499	1	0.3	-	-	-	-	1	0.1
Total	310		312		314		936	
Mean Length	414		406		395		405	

Table 26. Length composition of commercial whitefish for each month period from Area IV, 1980.

Length Interval (mm)	June		July		August		September		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
300 - 309	-	-	1	0.3	-	-	-	-	1	0.1
310 - 319	-	-	1	0.3	-	-	-	-	1	0.1
320 - 329	-	-	1	0.3	2	0.6	-	-	3	0.3
330 - 339	-	-	4	1.3	2	0.6	-	-	6	0.6
340 - 349	2	2.0	4	1.3	2	0.6	-	-	8	0.8
350 - 359	3	3.0	9	3.0	8	2.6	1	0.3	21	2.1
360 - 369	1	1.0	18	6.0	16	5.1	7	2.3	42	4.1
370 - 379	13	13.0	29	9.6	20	6.4	14	4.7	76	7.5
380 - 389	22	22.0	37	12.3	32	10.2	37	12.4	128	12.6
390 - 399	17	17.0	44	14.6	39	12.4	39	13.0	139	13.7
400 - 409	14	14.0	29	9.6	38	12.1	55	18.4	136	13.4
410 - 419	16	16.0	26	8.6	52	16.6	57	19.1	151	14.9
420 - 429	7	7.0	39	13.0	25	8.0	34	11.4	105	10.4
430 - 439	2	2.0	23	7.6	32	10.2	27	9.0	84	8.3
440 - 449	3	3.0	12	4.0	14	4.5	11	3.7	40	3.9
450 - 459	-	-	5	1.7	14	4.5	12	4.0	31	3.1
460 - 469	-	-	1	0.7	6	1.9	-	-	7	0.7
470 - 479	-	-	7	2.3	4	1.3	2	0.7	13	1.3
480 - 489	-	-	7	2.3	2	0.6	2	0.7	11	1.1
490 - 499	-	-	-	-	1	0.3	-	-	1	0.1
500 - 509	-	-	2	0.7	1	0.3	-	-	3	0.3
510 - 519	-	-	-	-	3	1.0	-	-	3	0.3
520 - 529	-	-	1	0.3	-	-	-	-	1	0.1
530 - 539	-	-	-	-	-	-	1	0.7	1	0.1
540 - 549	-	-	-	-	1	0.3	-	-	1	0.1
550 - 559	-	-	1	0.3	-	-	-	-	1	0.1
Total	100		301		314		299		1014	
Mean Length	396		404		408		409		406	

Table 27. Length composition of commercial whitefish for each month period from Area V, 1980.

Length Interval (mm)	July		August		September		Total	
	No.	%	No.	%	No.	%	No.	%
330 - 339	1	0.3	-	-	-	-	1	0.1
340 - 349	3	1.0	1	0.3	-	-	4	0.4
350 - 359	1	0.3	1	0.3	2	0.7	4	0.4
360 - 369	-	-	3	1.0	-	-	3	0.3
370 - 379	3	1.0	7	2.2	5	1.6	15	1.6
380 - 389	9	2.9	18	5.8	10	3.3	37	4.0
390 - 399	15	4.9	30	9.6	26	8.4	71	7.6
400 - 409	38	12.3	63	20.2	36	11.7	137	14.8
410 - 419	44	14.2	59	18.9	65	21.1	168	18.1
420 - 429	48	15.5	58	18.6	64	20.8	170	18.3
430 - 439	43	13.9	44	14.1	48	15.6	135	14.5
440 - 449	43	13.9	12	3.9	24	7.8	79	8.5
450 - 459	25	8.1	6	1.9	17	5.5	48	5.2
460 - 469	10	3.2	7	2.2	6	2.0	23	2.5
470 - 479	12	3.9	1	0.3	5	1.6	18	1.9
480 - 489	6	1.9	1	0.3	-	-	7	0.8
490 - 499	1	0.3	1	0.3	-	-	2	0.2
500 - 509	4	1.3	-	-	-	-	4	0.4
510 - 519	3	1.0	-	-	-	-	3	0.3
Total	309		312		308		929	
Mean Length	429		415		421		422	

Table 28. Mean fork length and mean dressed weight by age group for commercial whitefish from all areas, summer 1980 and from Area IW December 1979 and February and June 1980.

Age Group (yr)	No.	Fork Length (mm) Mean	SD	Dressed Weight (g) Mean	SD
5	3	374	43.0	683	284.3
6	48	369	32.7	674	193.8
7	170	384	29.6	760	188.0
8	306	400	25.8	845	166.1
9	870	407	27.8	895	180.7
10	1266	414	27.0	940	194.6
11	917	423	28.1	991	206.0
12	521	433	29.9	1055	231.8
13	234	441	32.5	1090	284.0
14	110	458	38.7	1252	343.0
15	33	473	43.3	1382	443.1
16	13	501	29.7	1569	279.5
17	9	514	33.6	1656	345.0
18	-	-	-	-	-
19	-	-	-	-	-
20	3	526	9.7	1917	529.9
Total	4503	-	-	-	-
Mean 10.3	-	418	33.2	961	238.3

Table 29. Mean fork length and mean dressed weight by age group for commercial whitefish from Area IW, December 1979 and February and June 1980.

Age Group (yr)	No.	Fork Length (mm) Mean	SD	Dressed Weight (g) Mean	SD
5	1	416	-	1000	-
6	8	403	19.3	831	175.1
7	23	412	33.1	948	253.4
8	57	413	20.8	932	133.8
9	121	422	25.5	986	163.1
10	151	433	27.9	1073	204.1
11	79	442	26.7	1146	231.7
12	65	457	34.2	1282	298.5
13	43	480	31.5	1435	264.9
14	23	491	33.0	1570	291.4
15	9	500	25.5	1661	336.1
16	10	513	20.2	1680	171.9
17	6	524	19.4	1692	203.5
18	-	-	-	-	-
19	-	-	-	-	-
20	3	526	9.7	1917	529.9
Total	599	-	-	-	-
Mean 10.4		441	38.1	1140	301.4

Table 30. Mean fork length and mean dressed weight by age group for commercial whitefish from Area IE, summer 1980.

Age Group (yr)	No.	Fork Length (mm) Mean	SD	Dressed Weight (g) Mean	SD
5	1	376	-	600	-
6	7	392	33.4	821	243.0
7	26	383	25.8	733	149.0
8	49	402	30.3	844	207.3
9	235	409	32.8	907	218.7
10	394	414	30.0	935	222.2
11	259	430	32.9	1033	240.7
12	127	442	31.6	1124	240.9
13	48	450	30.7	1158	291.9
14	27	476	35.7	1377	297.2
15	8	485	33.0	1406	263.8
16	1	462	-	1000	-
17	2	523	24.7	1875	459.6
Total	1184	-	-	-	-
Mean 10.3		421	36.0	986	259.8

Table 31. Mean fork length and mean dressed weight by age group for commercial whitefish from Area II, summer 1980.

Age Group (yr)	No.	Fork Length (mm) Mean	SD	Dressed Weight (g) Mean	SD
5	1	330	-	450	-
6	26	351	21.4	587	126.4
7	94	379	24.5	732	142.5
8	128	395	21.9	823	142.7
9	245	405	21.0	883	134.2
10	292	414	21.1	951	156.1
11	86	425	19.9	1017	147.9
12	21	431	20.3	1045	147.4
13	3	427	25.8	1017	246.6
Total	896	-	-	-	-
Mean 9.2		405	26.7	889	174.6

Table 32. Mean fork length and mean dressed weight by age group for commercial whitefish from Area IV, summer 1980.

Age Group (yr)	No.	Fork Length (mm) Mean	SD	Dressed Weight (g) Mean	SD
6	2	337	40.3	475	176.8
7	16	377	41.7	738	261.7
8	47	388	31.0	783	201.2
9	189	396	25.5	826	157.7
10	294	403	22.8	869	155.9
11	249	412	25.8	924	175.0
12	106	424	24.8	1008	172.6
13	24	426	26.1	1042	262.4
14	9	472	21.6	1422	292.7
15	4	502	45.9	1838	510.5
16	-	-	-	-	-
17	1	438	-	1000	-
Total	941	-	-	-	-
Mean 10.3		407	29.0	897	203.9

Table 33. Mean fork length and mean dressed weight by age group for commercial whitefish from Area V, summer 1980.

Age Group (yr)	No.	Fork Length (mm) Mean	SD	Dressed Weight (g) Mean	SD
6	5	389	27.3	750	165.8
7	11	383	20.8	705	121.4
8	25	410	16.5	882	92.3
9	80	415	25.4	924	191.6
10	135	420	23.6	936	168.9
11	244	422	22.5	957	163.0
12	202	424	24.1	964	170.6
13	116	426	19.5	948	144.1
14	51	431	24.0	1012	201.4
15	12	436	35.0	1004	280.0
16	2	457	1.4	1300	282.8
Total	883	-	-	-	-
Mean 11.2		422	24.0	949	173.1

Table 34. Annual mortality rates for commercial whitefish for each month period from each area in 1980.

Area	Age-Classes Used	Survival (S)	SE of S	Var. of S	Annual Mortality Rate (A), where A = 1-S
IE					
June	11-17	0.4597	0.0315	0.0010	0.5403
July	11-14	0.3641	0.0325	0.0011	0.6359
August	11-17	0.5121	0.0293	0.0009	0.4879
October	11-13	0.1667	0.0455	0.0021	0.8333
Total Season	11-17	0.4284	0.0172	0.0003	0.5716
II					
July	11-13	0.1912	0.0473	0.0022	0.8088
August	11-13	0.2292	0.0599	0.0036	0.7708
September	10-12	0.1881	0.0387	0.0015	0.8119
Total Season	11-13	0.1985	0.0340	0.0012	0.8015
IV					
June	12-15	0.3333	0.0840	0.0071	0.6667
July	11-15	0.3566	0.0419	0.0018	0.6434
August	11-15	0.3182	0.0350	0.0012	0.6818
September	11-17	0.3366	0.0331	0.0011	0.6634
Total Season	11-17	0.3401	0.0194	0.0004	0.6599
V					
July	12-16	0.4123	0.0338	0.0011	0.5877
August	12-16	0.3958	0.0351	0.0012	0.6042
September	12-15	0.4142	0.0317	0.0010	0.5858
Total Season	12-16	0.4068	0.0193	0.0004	0.5932
IW					
December (1979)	10-13	0.3544	0.0533	0.0028	0.6456
February	11-15	0.5000	0.0481	0.0023	0.5000
June	11-20	0.6473	0.0221	0.0005	0.3527
Total Season	11-20	0.6050	0.0199	0.0004	0.3950
Total Lake	11-20	0.4638	0.0085	0.0001	0.5362